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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/362,521	07/28/1999	YUNZHOU LI	10360/027001	6953

7590 06/12/2002

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EXAMINER

PRIETO, BEATRIZ

ART UNIT PAPER NUMBER

2152

DATE MAILED: 06/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/362,521

Applicant(s)

LI, YUNZHOU

Examiner

B. PRIETO

Art Unit

2152

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/29/00.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Drawings have been objected to by the Draftsperson under 37 CFR 1.84 or 1.152, correction noted on PTO-948 is required. A proposed drawing correction or corrected drawings are required in reply to this office action to avoid abandonment of the application. The objection to the drawings is no longer held in abeyance. If reply does not include corrected drawings, proposed corrections, or reply to the drawings requirement, the reply would be held non-responsive.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crawley et. al. (Crawley) U.S. Patent No. 5,881,246.

Regarding claim 1, Crawley teaches features of the invention substantially as claimed, teaching

receiving link state (advertisements) from routers in a network (col 1/lines 13-20, 27-43, 56-63); and

constructing a routing table (database topology of (link-state advertisement (LSA) broadcast, i.e. from routers in network area) from the received link state (advertisement) packets, the table corresponding to a short path tree through multicast routers (OSPF: col 1/lines 27-43, multicast group members), however Crowley teachings of a routing table constructed based on the broadcast link-state advertisement packets between

routers in multicast group in a network area is not explicitly denoted "multicast routing table";

It would have been obvious at the time the invention was made to implement prior art teaching to perform the same functions as claimed, motivation would be to implement a routing system for reducing routing calculations and thereby reduce the resources for storing, network advertisements necessary for routing calculations, as taught by Crawley.

4. Claim 2-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawley et. al. (Crawley) U.S. Patent No. 5,881,246 in view of Haggerty et. al. (Haggerty) U.S. Patent No. 6,331,983.

Regarding claim 2, however the prior art discussed above, does not explicitly teach performing reverse path forwarding using the multicast routing table;

Haggerty teaches receiving a from routers members of a multicast group and transmitting said received packet to all routers connected to the receiving router's outgoing tree links and dropping those packets that are destined to routers that are not connected to receiving router's outgoing tree links (i.e. reverse path forwarding), based on knowing the members of its tree branch (col 6/lines 12-30, transmission paths for forwarding messages is performed using data recorded in the routing tables: col 5/lines 46-51, 56-65, multicast-enabled routers, col 11/lines 60-col 12/line 5).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to incorporate the means for performing reverse path forwarding using the multicast routing table, motivation would be dynamically update said enabling each multicast router to multicast packets based on its routing table including connection table entry, as taught by Haggerty.

Regarding claim 3, the link state advertisements comprise OSPF (Open Short Path First) link state advertisements (Crawley: col 5/lines 3-11, 20-37).

Regarding claim 4, the link state advertisements comprise MOSPF (Multicast Open Short Path First) link state advertisements (Crawley: col 5/lines 3-11, 20-37, Haggerty: col 6/lines 31-43).

Regarding claim 5, constructing the multicast routing table comprises determining if a router is a multicast router (Haggerty: col 6/lines 12-22) of a predetermined multicast group.

Regarding claim 6, wherein constructing the multicast routing table comprises using Dijkstra's short path algorithm (Crawley: col 4/lines 31-38).

Regarding claim 7, wherein the multicast routing table correlates addresses of destination multicast capable routers with addresses of multicast capable routers on a short path tree of multicast capable routers (Haggerty: col 6/lines 12-30).

Regarding claim 8, constructing a unicast routing table from the received link state advertisements (Haggerty: col 10/lines 56-col 11/line 19).

Regarding claim 9, wherein using the multicast routing table comprises configuring PIM (Protocol Independent Multicasting) to use the multicast routing table (Haggerty: col 6/lines 31-55, dense or sparse groups, col 14/lines 55-col 15/line 9).

Regarding claim 10, wherein configuring comprises providing a routine for a Protocol Independent Multicasting (PIM) Reverse path forwarding (RPF) Check function (Haggerty: col 14/lines 66-col 15/line 9. col 18/lines 4-18).

Regarding claim 11-12, wherein PIM uses the multicast routing table to perform reverse path forwarding in sparse mode and to perform reverse path forwarding in dense mode (Haggerty: col 14/lines 55-col 15/line 9).

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Regarding claim 13, comprising limitations of claims 1-2, 4, and 11-12 discussed above, same rationale is applicable.

Regarding claims 14-16, these claims are substantially the same as claims 8, 3 and 11-12, respectively, same rationale is applicable.

Regarding claim 17, this claim is the computer program product disposed on a computer readable medium, for multicast routing the computer program including instructions for causing a computer to perform the method disclosed on claim 1, same rationale is applicable.

Regarding claims 18-20, these claims are the computer program product disposed on a computer readable medium, for multicast routing the computer program including instructions for causing a computer to perform the method of claims 2, 4, and 7, respectively same rationale is applicable.

Regarding claims 21-22, these claims this claim is the computer program product disposed on a computer readable medium, for multicast routing the computer program including instructions for causing a computer to perform the method of claims 8-9 and 11-12, same rationale is applicable.

5. Applicant is urged to review the claims language for the use of non-obvious acronyms. All acronyms must be spelled-out entirely, at least when they are initially recited in the claims.

Citation of Pertinent Art:

6. prior art made of record and not relied upon is considered pertinent to applicant's disclosure; Copies of documents cited will be provided as set forth in MPEP§ 707.05(a):

A. Multicast routing extensions of OSPF: Moy, J., Proteon, Inc., Westborough, MA, ACM Periodical-Issue-Article, ISSN:0001-0782, 1994, pages 61-67.

Moy teaches performing reverse path forwarding using multicast routing table, link-state advertise comprising OSPF, MOSPF, reverse path forwarding in sparse mode and dense mode, multicast routing tables comprising PIM to use the routing table.

B. Applications, Technologies, Architectures, and Protocols for Computer Communication: Deering, S.; Estrin, D.; Farinacci, D.; Jacobson, V.; Liu, C.; Wei, L., SIGCOMM-ACM Special Interest Group on Data Communication, ACM ISBN: 0-89791-682-4, 1994, pages 126-135.

Deering et. al. teach performing reverse path forwarding using a constructed multicast routing table for learning the typology of the network, link-state advertise comprising OSPF, MOSPF, reverse path forwarding in sparse mode and dense mode, multicast routing tables comprising PIM to use the routing table.

C. The PIM Architecture for Wide-Area Multicast Routing: Deering, S.; Estrin, D.; Farinacci, D.; Jacobson, V.; Liu, C.; Wei, L., IEEE/ACM Transactions on Networking, vol. 4, No. 2, April 1996.

D. A preservation-based multicast (RBM) routing protocol for mobile networks: initial route construction phase, Scott Carson, M.; Batsell, S.G.. Kluwer Academic Publisher, Hingham, MA, ACM Periodical-Issue-Article, ISSN:1022-0038, 1995, pages 427-450.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Prieto, B.** whose telephone number is **(703) 305-0750**. The Examiner can normally be reached on Monday-Friday from 6:30 to 4:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's Supervisor, **Mark H. Rinehart** can be reached on **(703) 305-4815**. The fax phone number for the organization where this application or proceeding is assigned is **(703) 308-6606**. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is **(703) 305-3800/4700**.

Any response to this action should be mailed to:
Commissioner of Patents and Trademarks
Washington, D.C. 20231
or faxed to:

(703) 308-9051, (for formal communications intended for entry)

Or:

(703) 305-7201 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Fourth Floor (Receptionist), further ensuring that a receipt is provided stamped "TC 2100".

**MEHMET B. GECKIL
PRIMARY EXAMINER**

B. Prieto
Patent Examiner
June 12, 2002

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